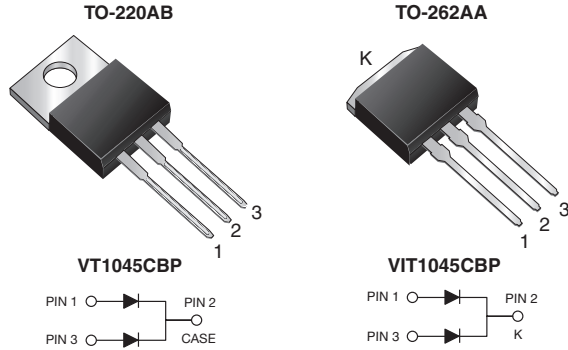


TMBS[®] (Trench MOS Barrier Schottky) Rectifier for PV Solar Cell Bypass Protection

 Ultra Low $V_F = 0.34 \text{ V}$ at $I_F = 2.5 \text{ A}$


FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- T_J 200 °C max. in solar bypass mode application
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT
HALOGEN
FREE

TYPICAL APPLICATIONS

For use in solar cell junction box as a bypass diode for protection, using DC forward current without reverse bias.

MECHANICAL DATA

Case: TO-220AB, TO-262AA

 Molding compound meets UL 94 V-0 flammability rating
Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 suffix meets JESD 201 class 1A whisker test

Polarity: as marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 5.0 A
V_{RRM}	45 V
I_{FSM}	100 A
V_F at $I_F = 5.0 \text{ A}$	0.41 V
T_{OP} max. (AC mode)	150 °C
T_J max. (DC forward current)	200 °C
Package	TO-220AB, TO-262AA
Circuit configurations	Common cathode

MAXIMUM RATINGS ($T_A = 25 \text{ °C}$ unless otherwise noted)				
PARAMETER	SYMBOL	VT1045CBP	VIT1045CBP	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	45		V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$ ⁽¹⁾	per device	10	A
		per diode	5.0	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode	I_{FSM}	100		A
Operating junction and storage temperature range (AC mode)	T_{OP}, T_{STG}	-40 to +150		°C
Junction temperature in DC forward current without reverse bias, $t \leq 1 \text{ h}$	T_J ⁽²⁾	≤ 200		°C

Notes

⁽¹⁾ With heatsink

⁽²⁾ Meets the requirements of IEC 61215 ed. 2 bypass diode thermal test

ELECTRICAL CHARACTERISTICS ($T_A = 25 \text{ °C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage per diode	$I_F = 2.5 \text{ A}$	$T_A = 25 \text{ °C}$	V_F ⁽¹⁾	0.44	-	V
				$I_F = 5.0 \text{ A}$	0.49	
	$I_F = 2.5 \text{ A}$	$T_A = 125 \text{ °C}$		0.34	-	
				$I_F = 5.0 \text{ A}$	0.41	
Reverse current per diode	$V_R = 45 \text{ V}$	$T_A = 25 \text{ °C}$	I_R ⁽²⁾	-	500	μA
		$T_A = 125 \text{ °C}$		5	15	mA

Notes

⁽¹⁾ Pulse test: 300 μs pulse width, 1 % duty cycle

⁽²⁾ Pulse test: Pulse width $\leq 40 \text{ ms}$



THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)					
PARAMETER		SYMBOL	VT1045CBP	VIT1045CBP	UNIT
Typical thermal resistance	per diode	$R_{\theta JC}$	3.5		$^\circ\text{C/W}$
	per device		2.5		

ORDERING INFORMATION (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-220AB	VT1045CBP-M3/4W	1.87	4W	50/tube	Tube
TO-262AA	VIT1045CBP-M3/4W	1.45	4W	50/tube	Tube

RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)

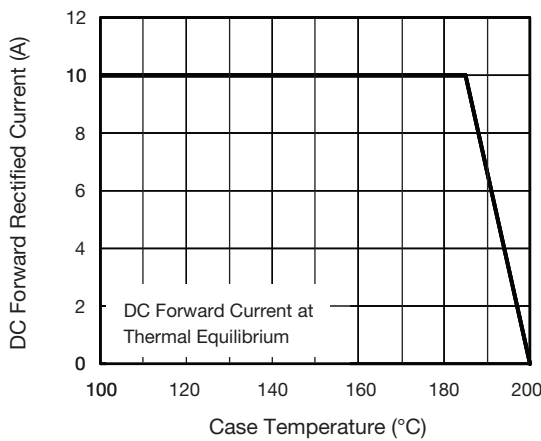


Fig. 1 - Maximum Forward Current Derating Curve

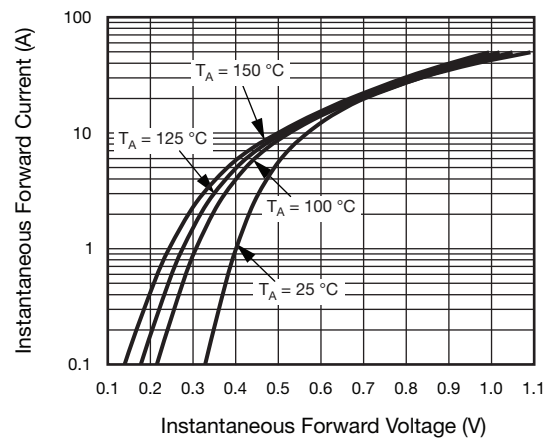


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

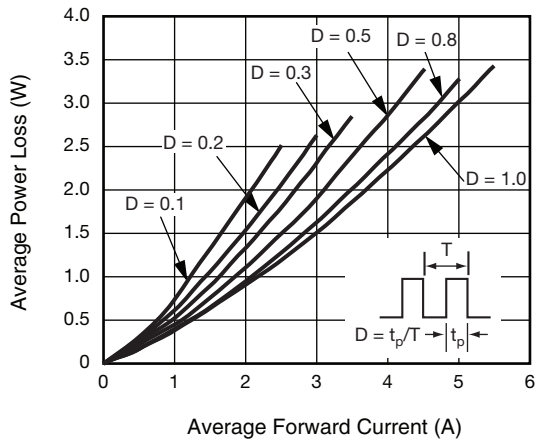


Fig. 2 - Forward Power Loss Characteristics Per Diode

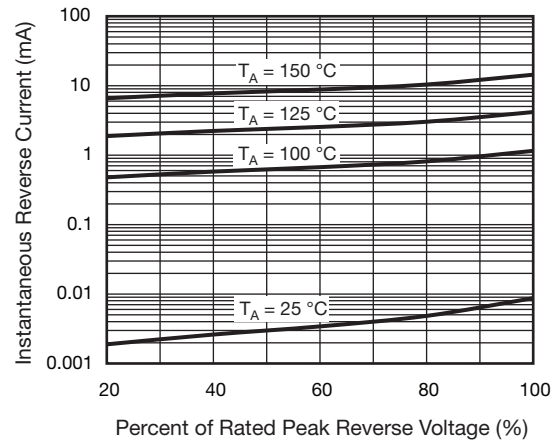


Fig. 4 - Typical Reverse Characteristics Per Diode

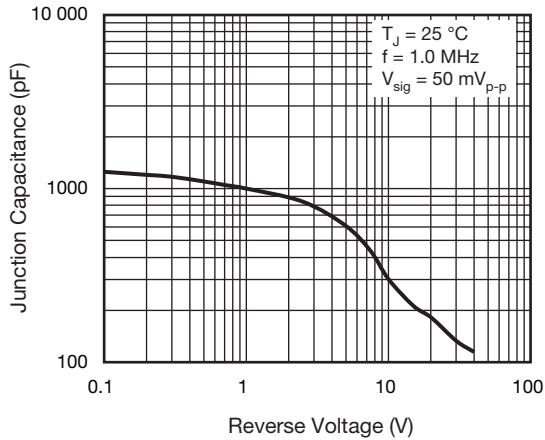


Fig. 5 - Typical Junction Capacitance Per Diode

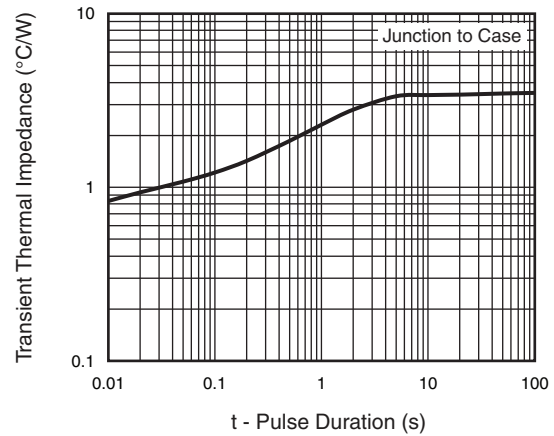
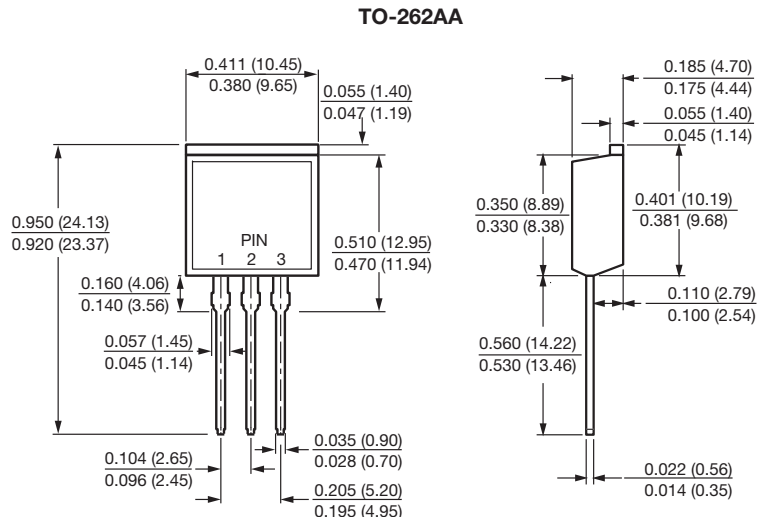
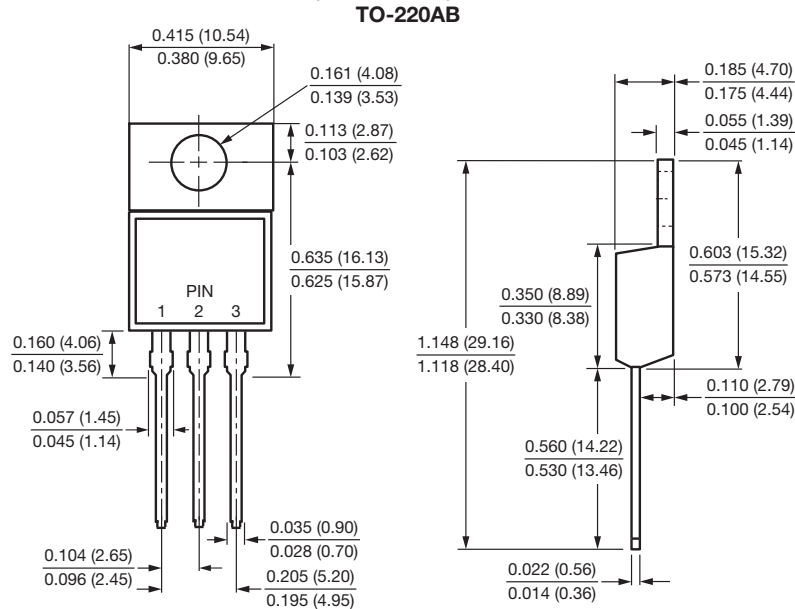


Fig. 6 - Typical Transient Thermal Impedance Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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